

Based on the initial survey preparation and field observations on Day 1 (December 5, 2012), the following field modifications were developed to be effective starting on December 6, 2012.

Field Modification Number: 20121206
Method (source): <i>Single-beam bathymetric survey data collection (QAPP Worksheet #14, #17, #18; FSP Section 2.1.1; SOP #5)</i>
Procedure Proposed for Modification and Rationale for Change:
<p>The QAPP developed for this bathymetric survey indicated that the single-beam data should be collected to approximately 2 feet (ft) water depth during the time period of +/- 2.5 hours centered on predicted high tide (as opposed to a particular datum).</p> <p>During initial field activities, it was determined that this target water depth was impractical due to the limitations of a single beam echosounder to digitize the seafloor within approximately 1 ft of the transducer face combined with the requirement to have the transducer's draft at a depth to allow surveying in less than perfect conditions. Also, accessing water depths of 2 ft with a vessel of sufficient size to navigate in Newark Bay is potentially unsafe due to rough seas and uncertain submerged hazards. A modification was recommended to clarify targeted water depths and maintain safe and practical working conditions for the crew and vessels.</p>
Proposed Modification:
<p>Ocean Surveys, Inc. (OSI) will "target" a water depth of approximately 3 ft during the time period of +/- 2.5 hours centered on predicted high tide, but stop surveying in the shoreward direction if 1) conditions are unsafe for vessel, crew and/or sonar equipment, or 2) the sonar loses track of the bed surface because the water is too shallow. Safety conditions shall be determined by the OSI captain(s) and crew. However, the surveyor should be clear that the project objectives are to obtain data collection as far shoreward as possible.</p>
Method (source): <i>Temporary Position Check-point (QAPP Worksheet #14; FSP Section 2.2)</i>
Procedure Proposed for Modification and Rationale for Change:
<p>The QAPP developed for this bathymetric survey indicated that the position check-point would be at the Port Elizabeth survey monument.</p> <p>During initial field activities, it was determined that having a temporary tide-board (or similar device) in Robbins Reef Yacht Club for positioning checks may be a valuable option in the event that work day duration and/or weather conditions make visiting the Port Elizabeth survey monument a hazard to crew and vessels (e.g., operating after dark, waves from wind). Robbins Reef Yacht Club is the marina where the survey vessels are docked.</p>
Proposed Modification:
<p>A tide-board (or similar device, e.g., PK nail set in a piling) at the Robbins Reef Yacht Club for XYZ position checks will be set up and utilized in the event a position check cannot be completed at the tide gage location at Port Elizabeth (e.g., if weather conditions prohibit). The XYZ coordinates of the temporary point shall be established, utilizing RTK GPS relative to the National Geodetic Vertical Datum of 1929 (NGVD29) elevations (vertical) and North American Datum of 1983 (NAD83) (horizontal), to achieve accurate horizontal and vertical position verification when used. As a quality control measure, a simultaneous water level observation will be made at the project tide staff (Port Elizabeth) and at the Robbins Reef Yacht Club temporary point to ensure the vertical accuracy of the temporary point.</p> <p>This temporary position check-point will be used in place of position checks at the tide gage located at Port Elizabeth when necessary. However, when possible, position check(s) will still be completed at the tide gage daily to verify tide gage and RTK GPS accuracy.</p>

Multi-beam and Single-beam Bathymetric Survey
Newark Bay Study Area
Fall/Winter 2012
Field Modification Form

Method (source): <i>Stilling Well (QAPP Worksheet #14, #22; FSP Section 2.2; SOP #3)</i>	
Procedure Proposed for Modification and Rationale for Change:	
<p>The QAPP developed for this bathymetric survey included SOP #3 – Tide Gage Installation that specified “a stilling well, or equivalent device, will be installed to minimize the effect of non-tidal water level fluctuation (induced by boat traffic or winds), if necessary.”</p> <p>The tide gage deployed by OSI uses a pressure transducer that mathematically compensates for non-tidal water level fluctuations that could “contaminate” the tide record, thereby mitigating the need for a stilling well.</p>	
Proposed Modification:	
<p>The device that OSI will be utilizing could be considered a stilling well (a clear 1-inch diameter tube) attached to their tide-board to aid in visual observation of the tide level (during comparisons of RTK GPS tides to the tide-board).</p> <p>The pressure sensors that are measuring the water level record 240 values at a frequency of 1 Hz, average the data, and record that data point at the appropriate time-mark. This process eliminates high frequency wave signals in the water surface elevation data that may bias the data.</p>	
Submitted by: <i>Carlie Thompson (Tierra Solutions, Inc.)</i>	Date: 12/11/2012
USEPA Approval:	Date:
Reviewed by Bathymetry Survey Manager: <i>George Reynolds (OSI)</i>	Date: 12/11/2012
Reviewed by QA Manager: <i>Rob Reed (ARCADIS)</i>	Date: 12/10/2012